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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/580,611	03/28/2007	Bengt Svensson	4147-164	3889

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EXAMINER	
HU, JENNIFER F	

ART UNIT	PAPER NUMBER
2821	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/580,611	SVENSSON ET AL.	
	Examiner	Art Unit	
	JENNIFER F. HU	2821	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *22 April 2009*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,3-5 and 7-10* is/are pending in the application.

4a) Of the above claim(s) *2 and 6* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,3-5 and 7-10* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *25 May 2006* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. Claims 1, 3-5, and 7-10 are pending.

Response to Arguments

2. In response to applicant's amendment to the specification correcting the typographical error, the objection to the specification is withdrawn.

3. In response to applicant's amendment to claim 1 removing the term "active", rejection under 35 U.S.C. 112, first paragraph is withdrawn.

4. Applicant's arguments filed April 22, 2009 have been fully considered but they are not persuasive.

5. In response to applicant's argument that Derneryd does not teach a distance between each transmitting array column in the array antenna is one wavelength of the transmitting frequency, examiner notes that both Derneryd and Falk teach that the separation between a transmission column and an adjacent receiving column is one half wavelength. Because the transmission columns are separated by a reception column, this indicates that the distance between two transmission columns is one wavelength. Furthermore, the specification of the application and previous claims appear to describe a different invention, wherein the distance between a transmission column and *an adjacent receiving column* is one wavelength (See Claim Rejections under 35 U.S.C. 112 below).

6. In response to applicant's argument that the claimed array antenna is not limited to performing scanning in only one dimension as taught by Derneryd, but may be used for different scan angles, examiner notes that the claim does not require that the antenna array be scannable in

more than one dimension. The claim only requires that the antenna array be scannable to reduce sidelobes entering visual space when scanning the main radiation lobe from an off boresight (i.e. away from the physical axis or normal of the antenna array, and therefore any angle other than 0 degrees). Derneryd teaches a scannable antenna array that reduces sidelobes entering visual space when scanning the main radiation lobe within a specified range of angles. Because Derneryd teaches the antenna array is scannable within a specific range of angles, the antenna array is considered scannable from an off boresight direction.

7. In response to applicant's argument the dependent claim 10 distinguishes from Derneryd by employing an equilateral triangular element by reciting "wherein said wave-guides are arranged symmetrically about a line that extends through a center of each waveguide," it is unclear how the recitation relates to an "equilateral triangular element."

Claim Rejections - 35 USC § 112

8. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

9. Claim 1 is rejected under 35 U.S.C. 112, second paragraph, as failing to set forth the subject matter which applicant(s) regard as their invention. Evidence that claim 1 fail(s) to correspond in scope with that which applicant(s) regard as the invention can be found in the reply filed November 20, 2008. In that paper, applicant has stated that the distance between each transmitting antenna array column and each receiving array is close to one wavelength in claim 2. This statement indicates that the invention is different from what is defined in the present claim(s) because claim 1 now states that the distance between each transmitting column is one

wavelength of the transmitting frequency and the distance between each receiving array column is one wavelength.

Claim Rejections - 35 USC § 103

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

11. Claims 1, 3-5, 7-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Falk in view of Proctor, further in view of Derneryd.

The applied reference by Falk has a common assignee with the instant application. Based upon the publication date of the reference (January 10, 2002), it constitutes prior art under 35 U.S.C. 102(b). This rejection under 35 U.S.C. 103(a) cannot be overcome by an affidavit under 37 CFR 1.130, 37 CFR 1.131 or 1.132.

As to claim 1, Falk teaches a sparse array antenna comprising series-fed antenna array columns comprising

transmitting array columns ("transmitting portion," 15, Fig. 1) and receiving array columns ("receiving portion," 10, Fig. 1) tuned to a respective transmit and receive frequency, each transmitting array column having multiple active transmitting radiator elements and each receiving array column having multiple active receiving antenna elements (col. 3, lines 5-10), wherein

said transmitting array columns are formed with a given distance between each one of the transmitting radiator elements, and a distance between each transmitting array column in the array antenna is one wavelength of the transmitting frequency (col. 1, lines 62 – 65 teach adjacent columns are well known to be spaced one half wavelength apart. Therefore, in an interleaved array, two transmitting array columns would be separated by a distance of one wavelength),

said receiving array columns are formed with a given distance between each one of the receiving radiator elements, and a distance between each receiving array column in the array antenna is one wavelength of the receiving frequency (col. 1, lines 62 – 65 teach adjacent columns are well known to be spaced one half wavelength apart. Therefore, in an interleaved array, two receiving array columns would be separated by a distance of one wavelength), and

the series-fed antenna columns being arranged in parallel to each other, thereby forming a symmetric interleaved transmit/receive array (Fig. 1).

Falk does not teach the active receiving radiator elements in the receiving array columns operate as parasitic elements in a transmit mode and active transmitting radiator elements in the transmitting array columns operate as parasitic elements in a receive mode, thereby reducing creation of grating lobes. Proctor teaches an antenna comprising a plurality of elements, where less than all of the elements are active elements, i.e., for radiating or receiving a signal where the other elements serve as parasitic elements to reflect, redirect or absorb some portions of the emitted signal to advantageously shape the transmitted beam in the transmit mode and similarly advantageously affect the receive beam pattern. The elements can be operative in either the active or parasitic mode as determined by an element controller [0072]. Therefore, it would have

been obvious to one of ordinary skill in the art that the inactive elements in the antenna array of Falk (i.e.. the transmitting columns during a receive mode or the receiving columns during a transmit mode) can operate as parasitic elements as taught by Proctor, and one of ordinary skill in the art would have been motivated to utilize the teachings or Proctor to provide a means for using the non-active antenna elements to advantageously shape and affect transmit and receive beam patterns.

Falk in view of Proctor do not teach the sparse array antenna includes a main radiation lobe and is arranged to be scannable to reduce sidelobes entering visual space when scanning the main radiation lobe from an off boresight direction. Derneryd teaches the sparse array antenna having a main lobe is arranged to be scannable to also provide reduced sidelobes entering visual space when scanning the main radiation lobe from an off boresight direction (col. 1, line 57- col. 2, line 9). It would have been obvious to one of ordinary skill in the art to modify the antenna array of Falk in view of Proctor to reduce the sidelobes in order to improve the performance of the antenna.

As to claim 3, Falk teaches a series-fed antenna array formed as extended ridged slotted wave guides ("array of wave guides…comprising a symmetrically or un-symmetrically placed ridge," abstract), comprising slotted transmitting wave-guides and slotted receiving wave-guides, tuned to said respective transmitting and receiving frequency ("narrow-band tuned for a respective transmitting or receiving frequency," abstract).

As to claim 4, Falk teaches when having number n of slots in each slotted transmitting wave-guide the number of slots in each slotted receiving wave-guide being generally n _+ x, where x represents an integer digit (x =0, 1, 2,3...). Claim 4 is so broad that it fails to further

limit claim 3 because any number of slots for the receiving and the transmitting wave guides would read on this claim.

As to claim 5, Falk teaches the series-fed array columns are formed as extended transmission lines ("wave guides," abstract) containing radiation elements ("slots," abstract), the array columns being tuned to said respective transmitting and receiving frequency ("narrow-band tuned for a respective transmitting or receiving frequency," abstract).

As to claim 6, Derneryd teaches the sparse array antenna having a main lobe is arranged to be scannable to also provide reduced sidelobes entering visual space when scanning the main radiation lobe from an off boresight direction (col. 1, line 57- col. 2, line 9).

As to claim 7, Falk teaches each one of the series-fed antenna columns is narrowly tuned within a respective frequency band to thereby reduce coupling between the transmitting and receiving bands used ("narrow-band tuned for a respective transmitting or receiving frequency," abstract).

As to claim 8, Falk teaches the series-fed antenna array columns are connectable to and feedable from an active receive/transmit (T/R) module ("feeding wave-guide," col. 3, lines 6-10, 4, 6, Fig. 1).

As to claim 9, Proctor teaches only one set of series-fed columns being actively used (508, Fig. 8) and another interleaved set of series-fed columns (500 or 502, Fig. 8) may be terminated by a load (504 and 506, Fig. 8) forming parasitic columns of the sparse array antenna.

As to claim 10, Falk teaches said wave-guides are arranged symmetrically about a line that extends through a center of each wave-guide (Figs. 1-2).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JENNIFER F. HU whose telephone number is (571) 270-3831. The examiner can normally be reached on Monday-Friday 9:00am - 4:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Douglas Owens can be reached on (571) 272-1662. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/JENNIFER F HU/
Examiner, Art Unit 2821

/Douglas W Owens/
Supervisory Patent Examiner, Art Unit 2821
May 8, 2009